UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
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September 27, 2021

VIA ELECTRONIC MAIL

Mr. Roger B. Petrie
Federal Facility Agreement Manager
Oak Ridge Office for Environmental Management
Department of Energy
Post Office Box 2001
Oak Ridge, Tennessee 37831

Dear Mr. Petrie:

The U.S. Environmental Protection Agency has completed review of the *Record of Decision for Comprehensive Environmental Response, Compensation, and Liability Act Oak Ridge Reservation Waste Disposal at the Environmental Management Disposal Facility, Oak Ridge, Tennessee* (DOE/OR/01-2794&D1) received on July 12, 2021.

This document presents the results of a combined effort between the U.S. Department of Energy Oak Ridge Office (DOE), the Tennessee Department of Environment and Conservation (TDEC) and the U.S. Environmental Protection Agency in addressing the need for additional radioactive, hazardous, and mixed waste management and disposal capacity under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

Comments are attached and must be resolved before a revised document is submitted.

If you have any questions or concerns regarding this matter or require additional information, then please contact me at (404) 562-8550, or electronically at froede.carl@epa.gov.

Sincerely,

Carl R. Froede Jr.
Senior Remedial Project Manager
Restoration & DOE Coordination Section
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cc: B. Henry, DOE
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EPA comments on the Record of Decision for Comprehensive Environmental Response, Compensation, and Liability Act Oak Ridge Reservation Waste Disposal at the Environmental Management Disposal Facility, Oak Ridge, Tennessee (DOE/OR/01-2794&D1)

General Comments

1. This Record of Decision (ROD) is specifically selecting Central Bear Creek Valley (CBCV) **Site 7c** as the location for the EMDF. Many references throughout the ROD cite CBCV but nothing is mentioned specific to Site 7c. The 2017 RI/FS also identifies Site 7a (in a dual site plan) in CBCV ~~at Site 7c~~ and this is shown in this ROD as Figure 2.2. Which landfill configuration is being selected? Please specify Site 7c in association with reference to the CBCV and identify it on a map so the reader can understand its specific location and configuration in Bear Creek Valley (Note: Site 7c is shown in Figures 2.4. and 2.5. on pages 56 and 58 of the D1 ROD but not identified as such. Site 7c should be clearly indentified as the location of the EMDF throughout this ROD).

2.

3.

4.

Specific Comments

1. Section 1.3 ASSESSMENT OF THE SITE, p. 1-5:

A. The remedial action objectives (RAOs) are unclear because they do not specify the time frame when the objectives will be met such as whether the objectives will be met throughout the construction, operation, and post-closure care of the landfill. Section 1.3 should reference tables of applicable or relevant and appropriate requirements (ARARs) in Appendix A. Chemical specific ARARs should be tabulated in the ROD and referenced in Section 1.3.

B. Remedial action objectives (RAOs) should be revised to add language to restore water quality in Bear Creek to meet ARARs and restore beneficial uses for Bear Creek to support healthy populations and communities of benthic macroinvertebrates and fish relative to a suitable reference location pursuant to TDEC 0400-40-03.

Commented [AC1]: Carl. This is a good comment, but I'm not sure it is an RAO of the EMDF ROD. Should it be an RAO of the BCV ROD? This one may need some internal discussion before transmitting to DOE.

X. Section 1.2 STATEMENT OF BASIS AND PURPOSE, p. 1-4. Twice the text references "30 CFR" when it should reference parts of 40 CFR. Wrong citation also occurs in top paragraph on page 2-50.

X. Section 1.5 STATUTORY DETERMINATIONS, p. 1-7. Add text that states the selected remedy was determined in the ROD to provide the best balance of tradeoffs among the alternatives with respect to the balancing criteria.

X. Section 2.3 HIGHLIGHTS OF COMMUNITY PARTICIPATION, p. 2-10. The text states:

This remedy was chosen in accordance with CERCLA, as amended by SARA and the NCP. This decision was based on the Administrative Record prepared for this project. The principal

documents supporting this ROD include the following:

- *Remedial Investigation/Feasibility Study for Comprehensive Environmental Response, Compensation, and Liability Act Oak Ridge Reservation Waste Disposal, Oak Ridge, Tennessee (DOE 2017a)*
- ***Focused Feasibility Study for Water Management for the Disposal of CERCLA Waste on the Oak Ridge Reservation, Oak Ridge, Tennessee (DOE 2016)***
- *Proposed Plan for the Disposal of Oak Ridge Reservation Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Waste (DOE 2018a).* (Bold added)

EPA Comment: The second bullet shown in italics above should be revised to clarify that this document has been updated and approved (cite new approval date, when available) and is not the original 2016 version of the document. This new version should be consistent with the D2 ROD (running parallel and approved before the final ROD is approved) to include the work conducted to address the EPA Administrator's decision in the protection of human health and the environment from radionuclide discharges to Bear Creek. All of the Dispute Resolution Agreement Team approved documents and corresponding calculations to establish safe radionuclide discharge limits should be included in this revised wastewater FFS.

X. Section 2.5.2 Groundwater. p. 2-13. The text refers to the absence of strike-parallel groundwater contamination in the Nolichucky Shale and Maryville Limestone around the Bear Creek Burial Grounds (BCBG) part of BCV. As noted in prior Remediation Effectiveness Reports and commented upon by EPA, there is an absence of groundwater monitoring in critical areas of the outcrop belts of these formations to the west of the BCBG. Thus, it is inappropriate to cite the groundwater conditions around the BCBG as supporting some conclusion or inference that groundwater contamination would not likely migrate along strike in these formations to the west of the EMDF area.

X. Section 2.5.3 Surface Water, p. 2-13. The second paragraph of Section 2.5.3 should add an explanation for the losing character of the streams. A losing stream implies a karst condition which is inconsistent with the characterization of the EMDF setting presented in Section 2.5.1.

X. Section 2.7 SUMMARY OF SITE RISKS. p. 2-16.

A. Please discuss the baseline risks from current conditions in Bear Creek. Discuss whether risk in question is additive risk on top of risks already present before construction of the facility. Describe the current ranges of contaminants in fish tissues and how the remedy will reduce the body burdens of contaminants in fish tissue to restore beneficial uses including support of healthy populations and communities of aquatic life.

B. TDEC has classified Bear Creek as having a fishable/swimmable goal. Bear Creek is CWA 303(d) listed for not currently achieving its designated uses on account of PCBs, mercury and cadmium ~~in fish and cadmium and mercury released from the S-3 Ponds~~. The creek lacks additional capacity to take on increased discharges of pollutants released from the landfill without increasing the degree of degradation of fish and macroinvertebrate communities by physical alteration and addition of pollutants. Releases from the landfill will likely further degrade downstream water bodies on the CWA 303(d) list. The ROD should discuss how CWA and TDEC 0400.40.03 were considered in the selection of the remedy.

Commented [AC2]: [HYPERLINK "https://www.tn.gov/content/dam/tn/environment/water/planning-and-standards/wr_wq_303d-2020-final.xlsx"]

found on [HYPERLINK "https://www.tn.gov/environment/program-areas/wr-water-resources/water-quality/water-quality-reports---publications.html"]

pretty sure BC is on CWA 303(d) list for mercury due to methylmercury in fish tissue. The link above is the TN 303(d) list. Bear Creek in on the tab labled "Lower Clinch River"

X. Section 2.8 REMEDIAL ACTION OBJECTIVES, p. 2-17. Please correct the acronym in the

following text:

> *Prevent adverse impacts to water resources (surface water and groundwater) from CERCLA waste or contaminants released from the waste through meeting chemical-, location-, and action-specific ARARs, and by preventing exposure that exceeds a human health risk of 10-4 to 10-6* ***ECLR*** *or HI of 1.* (Bold and underline added)

EPA Comment: The acronym should be ELCR - excess lifetime cancer risk.

X. Section 2.10.3 Long-term Effectiveness and Permanence, p. 2-27. The WAC were not fully developed at the time of the D1 ROD preventing the EPA from quantifying the long-term risk of the disposal facility. Without this information the protectiveness of the selected remedy cannot be assessed.

X. Section 2.12.1 Summary of the Rationale for the Selected Remedy, p. 2-35. The text states:

> • *The site is* ***adjacent*** *to an existing area designated as a CERCLA waste management area (i.e., EMWMF) along with several other CERCLA disposal areas in BCV.*

EPA Comment: This sentence is not clear and should be revised. The Site 7c EMDF location will be approximately 1.5 miles west of the existing EMWMF. While land use designation Zone 2 (the area containing the EMDF) is adjacent to Zone 3 (the area containing the EMWMF) the location of the EMDF is not "adjacent" to the existing EMWMF. Additionally, the italicized text is not accurate and should be changed to reflect TDEC-permitted Resource Conservation and Recovery Act managed landfills and not multiple CERCLA-managed landfills.

X. Section 2.12.2.3 Waste acceptance criteria, p. 2-39. The text states :

> *These criteria are derived from various constraints placed upon EMDF, such as specific risk* ***or dose limits*** *and design elements in regulatory-based laws and guidance, as well as constraints on waste acceptance that are established through discussion and agreement among the FFA parties (DOE, EPA, and TDEC).* (Bold and underlining added)

EPA Comment: Remove the words "or dose limits" since CERCLA is based solely on risk. The DOE-based dose limits will not be considered or used to make decisions in this CERCLA ROD.

X. Section 2.12.2.3 Waste acceptance criteria, p. 2-40. The text states:

> These two elements of the WAC (**along with additional procedures for implementing those WAC**) must be met before waste may be placed in the EMDF for disposal.

EPA Comment: What are the "additional procedures" highlighted in bold text? Please add text to clarify and explain what this entails.

X. Section **Analytic WAC**, p. 2-42. The text states:

> *The inventory (WAC) limits are the maximum values allowed per the ARAR dose for protection of the public, which has been deemed protective under CERCLA by EPA.*[5]
>
> [5] *EPA Administrator, Dispute Resolution Decision on radiological discharge limits for the Oak Ridge Reservation, December 31, 2020.*
> *Franklin Hill, EPA Region 4 Superfund Division Director, Regional Response to NRRB [National Remedy Review Board] Comments and Recommendations Oak Ridge Reservation Superfund Site, Oak Ridge, Tennessee, April 19, 2018.*
> *EPA Office of Solid Waste and Emergency Response, Establishment of Cleanup Levels for*

CERCLA Sites with Radioactive Contamination, OSWER No. 9200.4-18, August 22, 1997.

EPA Comment: Footnote 5 citing the 12/31/20, EPA Administrator decision addresses wastewater discharge and not the WAC. It is unclear if this statement is citing the old ARAR of NRC 10 CFR61, the 25/75/25 NRC dose and state rules 10 CFR 61.41/TDEC 0400-20-11-.16(2), or something different. Note that EPA considers the appropriate dose limit of 12 mrem as acceptable and nothing higher. Rewrite this sentence and modify the footnote to clarify the issue being discussed.

X. Section 2.12.2.3 Waste acceptance criteria, Page 2-45.

A. Ambient water quality criterion for protection of aquatic life of 1,400 ppt represents the criterion maximum concentration (CMC) or the concentration aquatic organisms can be exposed to for brief intervals, typically less than 48-hours without suffering detrimental effects. The 1,400 ppt CMC could apply to a short-term release of mercury to surface water, but it is not protective of chronic exposures. Revise this section to discuss the point of compliance and frequency of monitoring in terms of how the criteria will be applied.

B. Substantive requirements of TDEC surface water quality standards (WQS) include, in addition to numerical standards, anti-degredation requirements, which means DOE must not degrade waters such that they no longer meet their designated uses. There are no chemical specific EPA National Recommended Water Quality Criteria (NRWQC) for radionuclides in the CWA. However, TDEC has narrative WQS:

> *"The waters shall not be modified through the addition of pollutants or through physical alteration to the extent that the diversity and/or productivity of aquatic biota within the receiving waters are substantially decreased or adversed affected..."*

Although there is no chemical specific Tennessee WQS for radionuclides, the discharge must not violate TDEC narrative WQS. This means that radioactivity or other releases to the environment from the EMDF cannot cause damage to the diversity or productivity of benthic macroinvertebrate communities or fish communities. Radionuclides have long-half lives, and bioaccumulate in the environment. Monitoring for remedy effectiveness should include benthic macroinvertebrate and fish community surveys and measuments of mercury, PCBs, uranium, and radionuclides in forage fish and benthic macroinvertebrates to assess exposure. To the degree that baseline data are unavailable, data will be necessary to characterize the health of aquatic communities and their contaminant body burdens prior to the landfill construction to provide a point of comparison.

C. Text on Page 2-45 does not discuss control of mercury methylation although methylmercury is more mobile in the environment and is 90% of the total mercury in fish tissue. A study by Mathews et al. (2013) indicated that surface water concentration would likely need to be less than 51 ppt to achieve the tissue-residue based NRWQC for mercury in fish tissue of 0.5 ppm. Revise the text to discuss the effects of the proposed remedy on mercury methylation and how the proposed remedy will restore water quality in Bear Creek to meet ARARs and meet anti-degradation provisions of TDEC 0400-40-03.

D. In response to public comments regarding the disposal of mercury in the EMDF, DOE has indicated the Department will meet all regulatory requirements pertaining to mercury treatment and onsite disposal of waste, including Resource Conservation and Recovery Act of 1976 requirements that dictate WAC for mercury. The ROD is deficient because the selected remedy lacks a remedial action objective to reduce the concentrations of mercury in Bear Creek to meet ARARs and restore

beneficial uses nor has a waiver of the standards in the TDEQ WQS been included in the selected remedy.

X. Section 2.12.2.4 Description of EMDF operations, p. 2-46. The text states:

> *"Compliance with these discharge limits will assure human health and the environment are fully protected to the requirements of CERCLA."*

EPA Comment: The discharge limits pertain to compliance with the 10^{-5} risk specified in the Dispute Resolution Decision (footnote 6) and consistent with TDEC 0400-40-03-.03(4)(j) Footnote C, as determined based on site-specific exposure assumptions. These pertain to radionuclides and state that WACs should comply with a risk specified in TDEC rules. However, this provision may not be fully protective under CERCLA because risks of exposure to the environment to chemicals like mercury that bioaccumulate in biota were not considered. Please revise the text by removing the word "fully" and replacing it with a description of current/future risks, receptors, exposure pathways, and hazardous chemicals that are protected by the proposed remedy and the degree of protection provided, i.e., 10^{-5} risk, and any assumptions related to exposures that define the degree of protection afforded.

X. Section 2.12.2.4 Description of EMDF operations, p. 2-46. The text refers to a "…wastewater treatment system…sized to accommodate the estimated wastewater volume to be treated and designed to remove contaminants projected to exceed discharge criteria". There should be some statement in the ROD about how the wastewater volume to be treated has been (or will be) estimated and how contaminants projected to exceed discharge criteria have been (or will be) identified. Additionally, text should be added that explains the plans to minimize leachate or contact water generation during later phases of landfill operation.

X. Section 2.12.4 Expected Outcomes of the Selected Remedy, Page 2-49 and Table A.2, Location Specific ARARs. Please include Clean Water Act (CWA) 404(b)(1) as an ARAR. Text in Section 2.12.4 indicated wetlands mitigation would be implemented as required by ARARs. However, the text did not describe controls to prevent disruption of, impact to, or alteration of wetlands and how effectiveness of such controls would be measured using EPA's wetlands guidance with the goal of "no net loss": [HYPERLINK "https://www.epa.gov/cwa-404/background-about-compensatory-mitigation-requirements-under-cwa-section-404"]. Revise the text to cite the rules that require wetlands mitigation and refer to Table A.2. If loss is anticipated, outline the process by which on-site or off-site compensatory mitigation will be proposed.

X. Section 2.13.1 Overall Protection of Human Health and the Environment, p. 2-50. Please add reference to the groundwater RAO in this paragraph.

X. Section 2.13.2.1 Waiver to TSCA 40 CFR 761.75(c)(4), p. 2-51. The text states:

> DOE justifies a waiver of the TSCA hydrologic conditions requirement on the basis that the EMDF will be at least as protective due to the following design elements, which provide protectiveness exceeding that provided through the siting requirements (please note that floodplains and shorelands are being avoided and that the site will have monitoring wells and leachate collection):
> • More stringent liner and leachate detection and collection requirements under RCRA
> • Low permeability vadose zone geologic buffer material as committed to in this ROD.

EPA Comment: A third bullet must be added which states:

- A groundwater monitoring network around the EMDF compliant with RCRA requirements.

X. Section 2.13.2.3 Radiological Discharge Limits, p. 2-54. All of the data to be collected under the EPA Administrator's decision is to be documented in the revised *Focused Feasibility Study* [FFS] *for Water Management for the Disposal of CERCLA Waste on the Oak Ridge Reservation, Oak Ridge, Tennessee* (DOE/OR/01-2664&D3) Brackets added.. This FFS is to remain open and run parallel to the completion of the D2 EMDF ROD. The FFS will be approved once all the radionuclide-specific fish data have been collected, analyzed, and the radiological discharge limits derived. This FFS will then be placed in the Administrative Record for public availability. The public will be informed of the contents of the FFS through specific public outreach activities before the D2 EMDF ROD is approved and signed by the EPA Administrator. All of the information stated above must be included in this section of the EMDF ROD to inform the public.

X. Section 2.13.6, 5-Year Reviews, p. 2-56. Revise text to state when the five-year reviews will start to clarify whether it is during the time when the landfill is open to receiving wastes or only upon landfill closure. Revise to discuss frequency of monitoring and to whom and in what format the monitoring results will be reported in years between the five-year reviews. Revise the text to describe the entities that will be responsible for reviewing the monitoring data and deciding whether the remedy remains protective of human health and the environment. Explain by what criteria or standards protectiveness will be gauged. Include the point of compliance and list parameters that will be monitored.

X. Section 2.14.1 Impacts to Reindustrialization, p. 2-57. The text states:

> ***DOE's current goal is to transfer all of ETTP out of DOE ownership and for it to be beneficially reused.*** *The creation of a waste handling facility is inconsistent with this goal and a deterrent to future beneficial reuse of the site.* (Bold added)

EPA Comment: Figure 2.6. Proposed Rail Waste Route at ETTP (p. 2-58) clearly identies three separate areas across ETTP as "Retained By DOE." All three sites are former landfills and collectively they comprise approximately 63 acres. These sacrifice areas will require perpetual DOE controls on both the land surface and any groundwater contamination originating from these areas. This is inconsistent with the italicized sentence above. Please rewrite the italized sentence to more accurately reflect DOE's own anticipated Final Heritage Center End State Vision (with airport) shown in Figure 2.6.

X. Section 2.14.1 discusses several aspects of having a rail loading facility and rail line hauling waste that would be incompatible with ongoing and anticipated or potential redevelopment of the ETTP area. A part of one statement in this section reads "…daily hauling of radioactive waste is inconsistent with the development of the National Historic Park." This statement is unquestionably factual but would it not likewise in some sense apply to the removal and hauling of waste material and soils by truck from at least some of the same source areas to the EMDF? If so, then citing the movement of radioactive or other waste materials by rail as a negative aspect of the off-site disposal option would seem to be a misplaced argument for favoring onsite over offsite disposal unless it is presented in a comparative analysis to the waste handling and hauling elements of the onsite disposal option.

X. RESPONSIVENESS SUMMARY, SUMMARY OF COMMENTS AND RESPONSES, Socioeconomic impact, pp. 3-6 and 3-7. The text states:

> *To the contrary, jobs associated with construction and operation of the facility, and the*

*acceleration of cleanup enabled by onsite disposal and subsequent opportunities that **[it]** would present to the Y-12 and Oak Ridge National Laboratory, are expected to benefit both the economy and perception issues associated with environmental conditions in Oak Ridge.*(Bold added)

EPA Comment: Please insert the word "it" where indicated by brackets above or rewrite for better clarity.

X. RESPONSIVENESS SUMMARY, SUMMARY OF COMMENTS AND RESPONSES, Socioeconomic impact, p. 3-7. The text states:

Each of the comments received on the Proposed Plan was considered as to its potential implications to the ROD.

EPA Comment: Please rewrite the sentence. For example," Each comment received on the Proposed Plan was considered for its individual consequence to the ROD."

X. Appendix A APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS, Table A.2, Location Specific ARARs, p. A-8. The text considers the presence of floodplains as defined in 10 CFR 1022.4 However, not all executive orders and FEMA regulations pertaining to floodplains were considered. Federally approved projects must comply with Executive Order 11988 (Floodplain Management), as amended by Executive Orders 13690 and 11990 (Protection of Wetlands). The Federal Emergency Management Agency (FEMA) regulations in 44 CFR Part 9 set forth the responsibilities to implement and enforce Executive Order 11988, as amended by Executive Orders 13690 and 11990. Likewise, FEMA regulations found at 44 CFR 60.3(d)(2) and (3) prohibit encroachments that would result in any increase in flood levels during occurrence of base flood discharge. Please revise the ROD to discuss any long-term impacts of altered surface water hydrology and wetlands filling on potential for flooding. Please revise Table 2.1 comparing alternatives to consider potential long-term impacts on hydrology and flood retention.

(End of Comments)